Figure I.

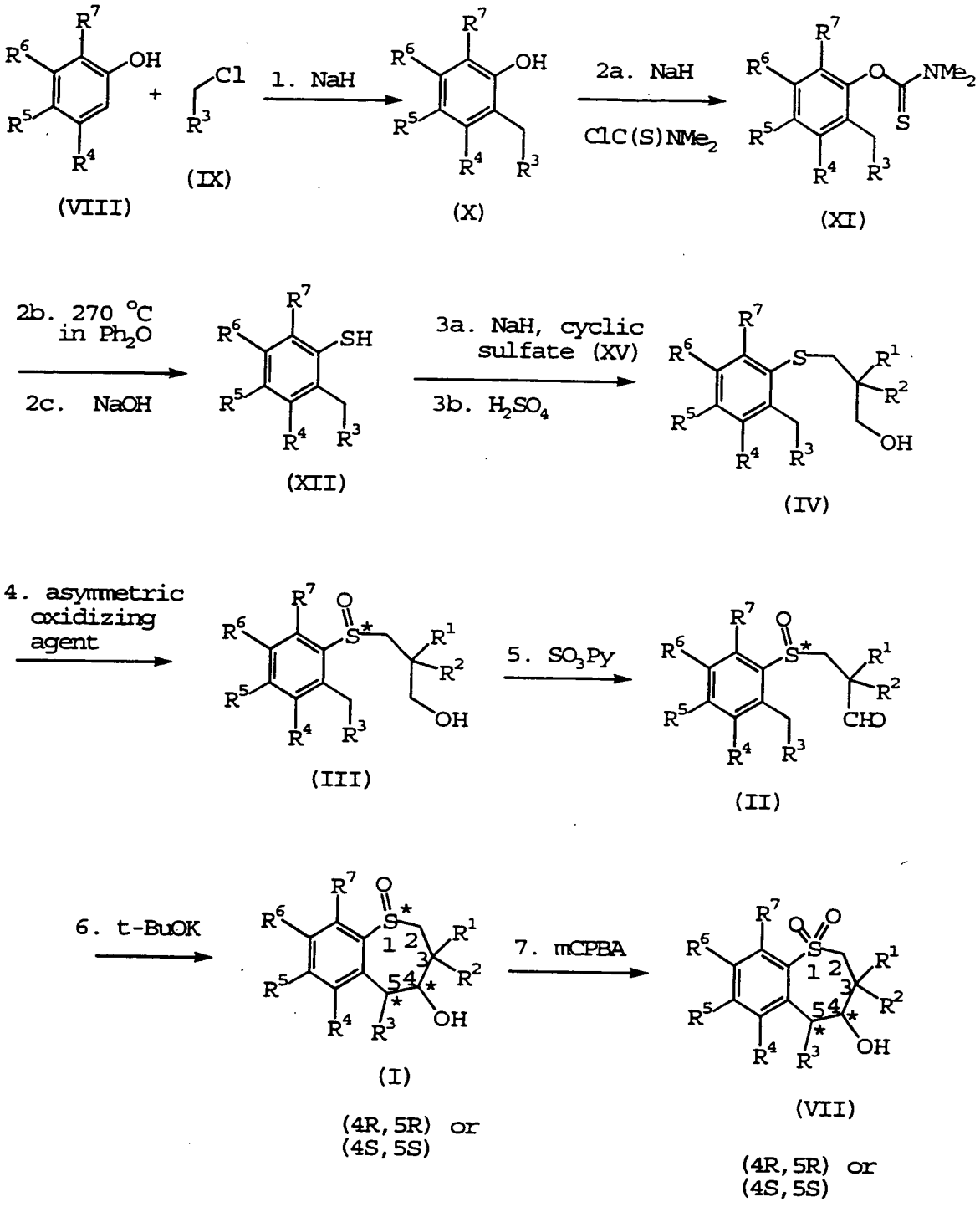
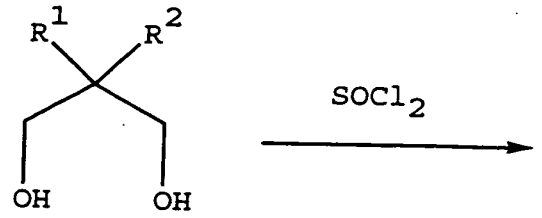
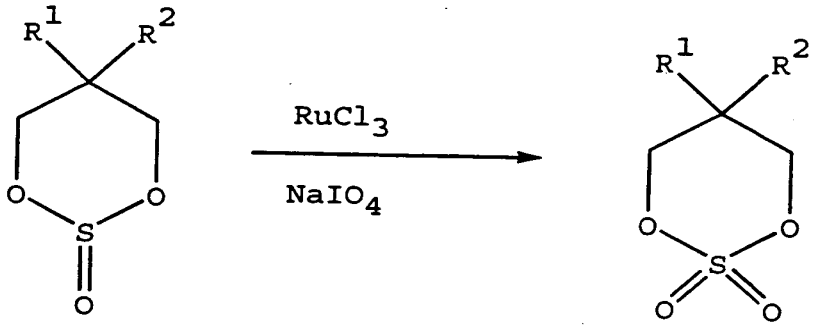

1. NaH
2a. NaH
ClC(S)NMe2
2b. 270 °C in Ph2O
2c. NaOH
3a. NaH, cyclic sulfate (XV)
3b. H2SO4
4. asymmetric oxidizing agent
5. SO3Py
6. t-BuOK
7. mCPBA
(VIII)
(IX)
(X)
(XI)
(XII)
(IV)
(III)
(II)
(I)
(4R,5R) or (4S,5S)
(VII)
(4R,5R) or (4S,5S)
* = chiral center

Figure II.



(XIII)



(XIV) (XV)